



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/656,453	09/05/2003	Yuan Wu	03-SIN-092	8429
7590 Lisa K. Jorgenson, Esq. STMicroelectronics, Inc. 1310 Electronics Drive Carrollton, TX 75006			EXAMINER PAUL, DISLER	
			ART UNIT 2614	PAPER NUMBER
			MAIL DATE 02/02/2009	DELIVERY MODE PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary

Application No.

10/656,453

Applicant(s)

WU ET AL.

Examiner

DISLER PAUL

Art Unit

2614

Period for Reply -- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 12 December 2008.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 2-9; 11-13-27-30-32 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 2-6; 8-9; 11; 13-26 is/are allowed.
- 6) ☒ Claim(s) 7; 27-30-32 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO/SB/808)
- 4) ☐ Interview Summary (PTO-413)
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: _____

DETAILED ACTION

Response to Arguments

1. Applicant's arguments with respect to claims 7, wherein "altering a frequency response of one or more of the filters" have been considered but are moot in view of the new ground(s) of rejection.

However, in regard to the "controller configured to cause the virtualizer to virtualize the at least one speaker" is non-persuasive, even though Kumamoto enable to virtualization with limited controller of High speed performance, but, Kumamoto does have controller configured to cause the virtualizer to virtualize the at least one speaker" (col.17 line 20-43).

Allowable Subject Matter

1. Claims 2-6; 8-9; 11; 13-26 are allowed.

RE claim 2, None of the prior art of record disclose of the specific wherein the virtualizer comprises: a filter configured to filter input signals comprising the audio information; a forward crossover path operable configured to receive, delay, and filter an output of the filter; a first combiner configured to produce first output signals for a first physical speaker using the output of the filter; a second combiner configured to produce second output signals for a second physical speaker using an output of the forward crossover path a first feedback crossover path configured to receive, delay, and filter the first

output signals, the second combiner further configured to produce the second output signals using an output of the first feedback crossover path; and a second feedback crossover path configured to receive, delay, and filter the second output signals, the first combiner further configured to produce the first output signals using an output of the second feedback crossover path.

Similarly, Re claim 3, 11, 18 have been analyzed and allowed for same reason as in claim 2.

Claim Rejections - 35 USC § 102

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

3. Claims 27 is rejected under 35 U.S.C. 102(b) as being anticipated by Kumamoto (US 6,385,766 B1).

Re claim 27, Kumamoto disclose of the method, comprising: generating first output signals for a first physical speaker; generating second output signals for a second physical speaker (col.21 line 1-20); filtering one or more input signals to produce one or more filtered input signals; providing one or more of the filtered input signals to one or more forward crossover paths; and generating the first and

second output signals using one or more of: one or more of the input signals, one or more of the filtered input signals, and one or more outputs from the forward crossover paths; providing the second output signals to a first feedback crossover path operable to receive, delay, and filter the second output signals; and providing the first output signals to a second feedback crossover path operable to receive, delay, and filter the first output signals; wherein generating the first output signals further comprises using an output from the second feedback crossover path; wherein generating the second output signals further comprises using an output from the first feedback crossover path; and wherein the first output signals emulate effects of a virtual speaker on one ear of a listener, the second output signals emulate effects of the virtual speaker on another ear of the listener, and each of the output signals at least partially cancels crosstalk caused by the other output signals (fig.6-8; col.21 line 1-20/virtual speakers and crosstalk with feed-forward and feedback for emulating sounds).

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. Claims 7, 32 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kumamoto (US 6,285,766 B1) and Bauck (US 7,167,566 B1).

Re claim 7, Kumamoto disclose of an audio processor, comprising: a virtualizer configured to process audio information to virtualize at least one speaker so that, from a listener's perspective, sounds appear to come from at least one direction where a physical speaker is not present; a controller configured to cause the virtualizer to virtualize the at least one speaker at any location in a space around the listener; and wherein (col.17 line 30-45/controller to cause virtual of speakers in any position around listener) and the virtualizer comprises at least one first filter, one or more forward crossover paths each comprising a first delay line and a second filter, and two feedback crossover paths each comprising a second delay line and a third filter (fig.5-8; col.16 line 35-55/filters and feedback and forward to enable virtualization of the speaker) , the controller causes the virtualizer to virtualize the at least one speaker by altering a delay of one or more of the delay lines (col.12 line 1-35; col.12 line 1-10; fig.6-8).

However, Kumamoto fail to disclose of the specific wherein the controller causes the virtualizer to virtualize the at least one speaker by altering a frequency response of one or more of the filters. But, Bauck disclose of a system wherein the controller causes the virtualizer to virtualize the at least one speaker by altering a frequency response of one or more of the filters (col.7 line 1-30; col. 26 line 40-55/equalize and modify of frequencies with inherent controller to be implemented). Thus, taking the combined

teaching of Kumamoto and Bauck as a whole, it would have been obvious for one of the ordinary skill in the art to have modified Kumamoto with the controller causes the virtualizer to virtualize the at least one speaker by altering a frequency response of one or more of the filters for producing the desired timbral changes and producing audio image sound.

Re claim 32, Kumamoto et al. disclose of the method comprising: generating first output signals for a first physical speaker and generating second output signals for a second physical speaker (fig.6-7/wt speakers); and wherein the first and second output signals are produced using one or more first filters, one or more forward crossover paths each comprising a first delay line and second filter, and two feedback crossover paths each comprising a second delay line and a third filter; and altering a delay of one or more of the delay lines to change the location of one or more of the virtualized speakers (fig.6-12; col.12 line 1-35; to create virtual sound/with feedback and forward path with delay and filters).

However, Kumamoto fail to disclose of the specific wherein altering a frequency response of one or more of the filters. But, Bauck disclose of a system wherein altering a frequency response of one or more of the filters (col.7 line 1-30; col. 26 line 40-55/equalize and modify of frequencies with inherent controller to be implemented).

Thus, taking the combine teaching of Kumamoto and Bauck as a whole, it would have been obvious for one of the ordinary skill in the art to have modified Kumamoto with wherein altering a frequency response of one or more of the filters for producing the desired timbral changes and producing audio image sound.

5. Claims 30- 31 are rejected under 35 U.S.C. 103(a) as being unpatentable by Kumamoto (US 6,285,766 B1) and Kawano (US 6,804,358 B1).

Re claim 31, Kumamoto et al. disclose of the method of claim 32 with virtual sounds (col.21 line 5-20/create sound at multiple around with the two output signals speakers), but, Kumamoto et al. fail to disclose of the specific wherein the first and second output signals emulate the effects of multiple virtual speakers at any locations in a space around the listeners. But, kawano disclose of a system wherein similar concept of having multiple virtual speakers at any locations in a space around the listeners with the first and second output signals (fig.1,6; col.3 line 30-46) for purpose of creating a theater sound effect for optimum sound experience. Thus, taking the combined teaching of Kumamoto et al. and Kawano as a whole, it would have been obvious for one of the ordinary skill in the art to have modify Kumamoto et al. with the similar concept of having multiple virtual speakers at any locations in a space around the listeners with the first and second output signals for purpose of creating a theater sound effect for optimum sound experience.

Re claim 30 has been analyzed and rejected with respect to claim 31.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to DISLER PAUL whose telephone number is (571)270-1187. The examiner can normally be reached on 7:30-5:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Chin Vivian can be reached on 571-272-7848. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/D. P./
Examiner, Art Unit 2614

/Vivian Chin/
Supervisory Patent Examiner, Art Unit 2614